

REMARKS

This Preliminary Amendment is filed together with a Transmittal Letter to the U.S. Designated Office (DO/US) Concerning a Filing under 35 U.S.C. 371 (entry into the U.S. National Stage).

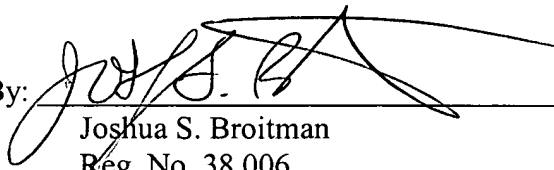
Applicant requests that the amendments to the specification, claims and drawings set forth in the annexed Specification Amendments, Claim Amendments and Drawing Amendments be entered in the U.S. National Stage Application. The claims are amended to remove multiple dependencies and improve form. The specification is amended to improve grammar. The drawing is amended to correct a reference number. No new matter was added to the application by the above amendments.

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Respectfully submitted,

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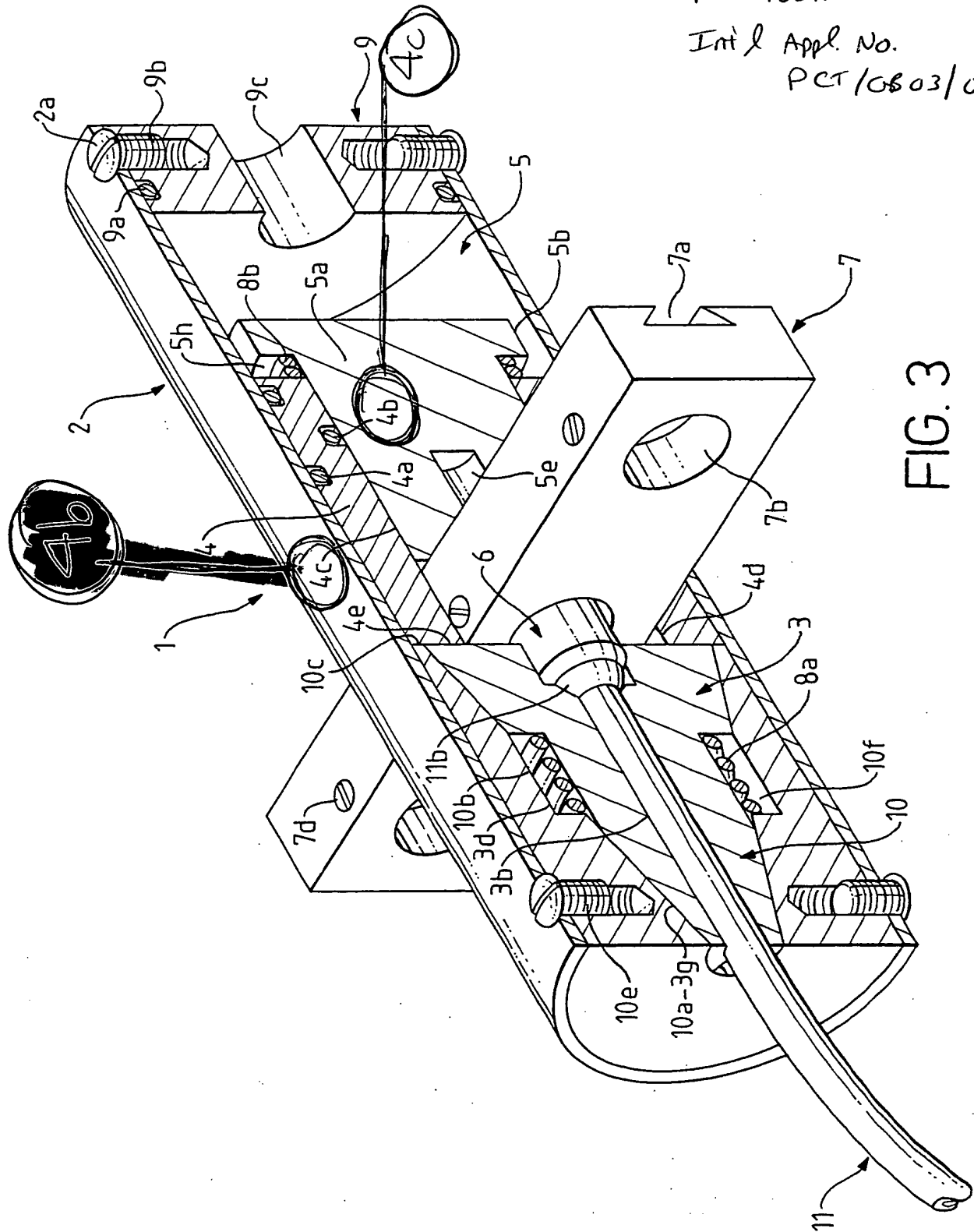


FIG. 3

SPECIFICATION AMENDMENTS

Please amend the specification in the above-identified application as set forth below.

Replace the paragraph beginning on page 1, line 10 of the originally filed application with the following amended paragraph:

Various types of pipe flaring tools are known. ~~known~~, However, such tools usually involve several disadvantages in providing proper flaring especially on steel pipes. A dual split die may be used to clamp the pipe to be worked. However, substantial abutment surfaces on the split die are prone to the build up of foreign bodies and corrosion preventing adequate clamping of the worked pipe. The final closure of the split die is usually affected by the use of a nut or similar device in conjunction with a screw threaded portion – such procedure is both time consuming and awkward as a hand held flaring tool is required to be held in one hand and an operating nut turned by a wrench or socket held in the other hand.

Replace the paragraph beginning on page 8, line 5 of the originally filed application with the following amended paragraph:

An aperture (10d) is shown in the outer end face of the chuck clamp (10) and an internal surface ~~(10b)~~ of the chuck clamp diverges outwardly towards the innermost end face (10c) of the chuck clamp (10) relative to the housing (2). A generally central section of the internal surface of the chuck clamp extends parallel to the axis of the housing (2) and ~~An increased diametrical portion of the internal surface (10b) of chuck clamp (10) forms with the~~ clamping chuck (3)[,] defines a recess (10f) in which spring (8a) is located. As will be hereinafter described end face (10c) acts as a stop to prevent further inward movement of outer piston (4) relative to housing (2) when outer piston (4) moves under hydraulic pressure applied through boss (9). End face (3h) of chuck (3) aligns with end face (10c) when the chuck and chuck clamp are fully engaged together.

Replace the paragraph beginning on page 8, line 15 of the originally filed application with the following amended paragraph:

[A] In Figure 3, a pipe (11) is shown located within the three jawed clamping chuck (3) with the open end (11b) of the pipe flared following interaction, as will hereinafter be described with the flaring head tool (6). At As shown in Figure 4, at the opposite end of the housing (2) to the chuck clamp (10) a flexible pipe (12) extends from the housing via aperture (9c) in end boss (9) and is used to vary hydraulic pressure applied to the pistons (4, 5). The pipe (12), as shown in Fig. 5, is connected via a connection (13) to a hydraulic pump (14) having a mechanical drive (15) operable by an operator's foot. The respective ends of the pipe (12) are sealingly fitted in screw threaded engagement with appropriate sealing elements in a manner which is well known in the art, which does not form part of the present invention and which will therefore not be described further.

Replace the paragraph beginning on page 9, line 10 of the originally filed application with the following amended paragraph:

~~As shown more clearly~~ shown in Fig. 2 outer piston (4) has an external cylindrical surface which is of a diameter complementary with the internal cylindrical surface of the housing (2) and is arranged to slide longitudinally of the housing. Two seals (4a) are provided for sealing the outer piston relative to the internal surface of the housing (2). The outer piston (4) has an internal cylindrical aperture (4b) in which there is located an annular seal (4c). Inner piston (5) is slidably engaged via its cylindrical surface (5a) with the aperture (4b), the seal (4c) sealing the inner and outer pistons one relative to the other.

Replace the paragraph beginning on page 10, line 5 of the originally filed application with the following amended paragraph:

As previously described the inner piston (5) slides within the inner aperture (4b) of the outer piston (4) and is sealingly engaged relative thereto by seal (4b) (4c). An increased diameter portion (5b) of the inner piston (5) serves as an end stop for helical compression spring (8b) located on the outer cylindrical surface (5a) of the inner piston (5) in a recess (5h) defined between the end stop (5b) and end face (4g) of the outer piston (4).

Replace the paragraph beginning on page 14, line 5 of the originally filed application with the following amended paragraph:

Although ~~the description~~ of the embodiment shown in Figs. 1 through 5 ~~are~~ is described with reference to a single flaring, it may also be possible by appropriate shaping of the chuck (3) and working face (6b) of the flaring tool head (6) to use the same apparatus and method to perform a double or other flaring operation.

CLAIM AMENDMENTS

Please amend claims 1, 3, 4, 7, 9, 11-16, 18-21, 23-26, 28-31, 33 and 34, and add new claims 35-42 as set forth in the following listing of claims:

I CLAIM:

1. (Currently amended) A pipe flaring apparatus comprising a housing, a multi-jawed chuck located in the housing for supporting [a] an end of a pipe therein ~~to be flared~~, closing means in the housing for ~~opening or~~ closing the jaws of the chuck to clamp the jaws on to the pipe, and ~~further~~ flaring means in the housing ~~being~~ operable to flare the ~~ends~~ end of the pipe clamped in the jaws.

2. (Original) An apparatus as claimed in claim 1, wherein the multi-jawed chuck comprises a tapered external surface.

3. (Currently amended) An apparatus as claimed in claim 2, wherein the closing means ~~for closing the jaws of the chuck~~ comprises a chuck clamp having a tapered internal surface generally complementary to the ~~external~~ tapered external surface of the multi-jawed chuck and effects closing of the jaws of the chuck as the chuck is moved inwardly relative to the chuck clamp.

4. (Currently amended) An apparatus as claimed in ~~any preceding claim~~, claim 3, wherein the ~~further~~ flaring means comprises a flaring tool.

5. (Original) An apparatus as claimed in claim 4, wherein the flaring tool is mounted on moveable means.

6. (Original) An apparatus as claimed in claim 5, wherein the movable means comprises a piston for moving the flaring tool into engagement with the end of the pipe to be flared.

7. (Currently amended) An apparatus as claimed in claim 6, ~~wherein the piston 5,~~
wherein the movable means comprises first and second pistons for moving the flaring tool into engagement with the end of the pipe to be flared.

8. (Original) An apparatus as claimed in claim 7, wherein the second piston is adapted to move the multi-jawed chuck into engagement with the chuck clamp to close the jaws of the chuck about the pipe.

9. (Currently amended) An apparatus as claimed in claim 7 ~~or claim 8~~, wherein the flaring tool is mounted on the first piston for movement therewith.

10. (Original) An apparatus as claimed in claim 9, wherein the first piston is slidable relative to the second piston.

11. (Currently amended) An apparatus as claimed in claim 9, ~~or claim 10~~ wherein the first ~~or inner~~ piston is slidable within the second ~~or outer~~ piston.

12. (Currently amended) An apparatus as claimed in ~~any of claims 7 to 11~~, claim 7, including biasing means located between the first and second pistons for retracting the flaring tool from the pipe after the pipe is flared.

13. (Currently amended) An apparatus as claimed in ~~any preceding~~ claim 1, including biasing means located between the closing means and the multi-jawed chuck for separating the closing means and multi-jawed chuck.

14. (Currently amended) An apparatus as claimed in ~~any preceding~~ claim 1, including biasing means located between the jaws of the chuck to open the jaws to disengage the flared pipe from the pipe flaring apparatus.

15. (Currently amended) An apparatus as claimed in ~~any preceding~~ claim 1, including hydraulic means for moving the closing means and the flaring means to close the jaws of the chuck and engage the flaring means within the pipe.

16. (Currently amended) An apparatus as claimed in ~~any preceding~~ claim 1, further comprising a tool holder for supporting the flaring means.

17. (Original) An apparatus as claimed in claim 16, wherein the tool holder extends transversely relative to a longitudinal axis of the housing.

18. (Currently amended) An apparatus as claimed in claim 16 ~~or claim 17~~, wherein the housing includes two diametrically opposed windows through which the tool holder is arranged to extend.

19. (Currently amended) An apparatus as claimed in claim 16, ~~17 or 18~~, wherein the tool holder extends through a recess in the ~~flaring means~~ housing.

20. (Currently amended) An apparatus as claimed in claim 19, further comprising a piston for moving the flaring means into engagement with said end of the pipe, wherein the tool holder is slidably mounted on ~~the flaring means but fixed relative to a longitudinal axis of the flaring means~~. a mounting disposed at an end of said piston which end faces said multi-jawed chuck.

21. (Currently amended) An apparatus as claimed in claim 20, ~~including~~ wherein the flaring means comprises a flaring tool mounted on the tool holder.

22. (Original) A method of flaring a pipe comprising inserting a pipe to be flared into a housing through a multi-jawed chuck and closing means for closing the jaws of the chuck, and operating flaring means located in the housing to flare the end of the pipe.

23. (Currently amended) A method as claimed in claim 22, comprising closing the jaws of the chuck to clamp the jaws around the pipe to support the pipe during flaring ~~or interengaging complementary tapering surfaces of the multi-jawed chuck and the chuck clamp.~~

24. (Currently amended) A method as claimed in claim 22, ~~or claim 23,~~ comprising wherein the operating step comprises moving the flaring means to flare the pipe.

25. (Currently amended) A method as claimed in claim 24, wherein the flaring means comprises a flaring tool and moving the flaring means comprises moving a piston to which [a] the flaring tool is attached ~~for flaring the end of a pipe.~~

26. (Currently amended) A method as claimed in claim 25, ~~wherein moving the piston~~ 24, wherein the step of moving the flaring means comprises moving a first and a second piston.

27. (Original) A method as claimed in claim 26, comprising moving the second piston to close the jaws of the multi-jawed chuck.

28. (Currently amended) A method as claimed in claim 26 ~~or 27,~~ comprising moving the first piston to effect flaring of the pipe.

29. (Currently amended) A method as claimed in claim 27 ~~or claim 28,~~ comprising moving the first ~~or inner~~ piston relative to the second ~~or outer~~ piston.

30. (Currently amended) A method as claimed in claim 29, comprising moving the ~~inner~~ first piston within the ~~outer~~ second piston.

31. (Currently amended) A method as claimed in claim 30, comprising biasing the ~~inner~~ first piston relative to the ~~outer~~ second piston for retracting the flaring tool from the pipe after the pipe is flared.

32. (Original) A method as claimed in claim 31, comprising biasing the multi-jawed chuck relative to the chuck clamp to disengage the flared pipe from the flaring apparatus.

33. (Currently amended) A method as claimed in ~~any preceding claim~~ claim 22, comprising moving the closing means and the flaring means to close the jaws of the chuck and engage the flaring means with the pipe by actuating hydraulic means.

34. (Currently amended) A method as claimed in ~~any preceding claim~~, claim 22, wherein the flaring means comprises a flaring tool and comprising moving a tool holder transversely of the flaring means to locate [a] the flaring tool for flaring [a] the pipe.

35. (New) A pipe flaring tool for flaring an end of a pipe, said tool comprising a clamping device for releasably clamping said end of a pipe and an actuator for causing said clamping device to clamp said end of the pipe, said actuator being operable to press a forming tool into said end of the pipe to flare said end of the pipe.

36. (New) A tool as claimed in claim 35, wherein said actuator comprises a first piston for causing said clamping device to clamp said pipe and a second piston for pressing said forming tool into said end of the pipe.

37. (New) A tool as claimed in claim 35, wherein said clamping device defines a die for cooperating with said forming tool to flare said end of the pipe.

38. (New) A tool as claimed in claim 35, further comprising a forming tool carrier and wherein said clamping device and said actuator are housed in a housing having a longitudinal axis, said housing defining an opening for receiving said forming tool carrier and said forming tool carrier being slidable through said opening in a direction transverse to said longitudinal housing for removably moving a said forming tool into a position from which it can be pressed into said end of the pipe by said actuator.

39. (New) A tool as claimed in claim 38, wherein said actuator comprises a first piston for causing said clamping device to clamp said pipe and a second piston for pressing said forming tool into said end of the pipe and said second piston has an end defining a recess for receiving said tool carrier.

40. (New) A tool as claimed in claim 39, wherein said end of the second piston has a mounting disposed thereon for slidable interengagement with said tool carrier.

41. (New) A tool as claimed in claim 38, wherein said tool carrier has a plurality of forming tool carrying portions, whereby the tool carrier can carry a plurality of tools.

42. (New) A pipe flaring tool for flaring an end of a pipe, said tool comprising:
a housing;
a clamping device disposed in said housing for releasably clamping said pipe and defining a die for receiving said end of said pipe;
a first piston slidable in said housing for applying a force to said clamping device to cause said clamping device to clamp said pipe;
a tool carrier insertable into said housing through a tool carrier receiving aperture to bring a forming tool carried thereon into line with said die; and
a second piston slidable in said first piston for first applying a force to said first piston for sliding said first piston into engagement with said clamping device to apply said force and second for pressing said tool carrier towards said clamping device to move said forming tool into said end of the pipe, said housing being connectable to a source of pressurized fluid for causing said sliding movement of said first and second pistons.